

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the following remarks.

Claim Status

Claims 1-17 were originally filed. Claims 18-19 were previously added in a preliminary amendment. Currently, claims 1-19 are pending.

§103 Rejection

Claim 1 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application No. 2003/0122111 to Glatkowski (hereinafter referred to as "Glatkowski"). Applicant respectfully traverses.

The Examiner stated in the instant office action that Applicant's amendment of the language of claim 1 to "consisting of" overcame the previous rejection under 35 U.S.C. §102(b) as being anticipated by Glatkowski. Thus the Examiner admits that Glatkowski does not contain all of the elements of claim 1. The Examiner now claims that Glatkowski teaches or suggests all of the limitations of claim 1. This could not be further from the truth. Claim 1 describes "A carbon nanotube dispersion liquid consisting of a carbon nanotube, an amide-based polar organic

solvent, and a polyvinylpyrrolidone (PVP). Glatkowski states that:

Nanotube concentration was increased to almost 50% in the conductive layer. This was done by modifying the nanotubes with a coating of polyvinylpyrrolidone (PVP). This is also referred to as wrapping the nanotubes with a helical layer of polymer. To accomplish this, SWNTs were suspended in sodium dodecy sulfate and PVP. This solution was then incubated at 50° C. for 12 hours and then flocculated with IPA.

(See Paragraph 131). Comparing claim 1 with Glatkowski, Glatkowski is clearly different in that the composition described in Glatkowski requires the inclusion of sodium dodecy sulfate (SDS) while claim 1 of the instant invention does not include SDS. The Examiner attempts to explain this away by stating in the office action that the composition described in Glatkowski "may further comprise additives such as surfactant" (i.e., sodium dodecy sulfate (SDS)). As the above quoted language clearly demonstrates, Glatkowski did not make the inclusion of SDS in its composition optional. Thus, Glatkowski requires the suspension of SWNTs in sodium dodecy sulfate (SDS) and PVP in solution. This is in contrast to the instant invention which omits the inclusion of SDS in claim 1.

The prior art reference or combination of references relied upon by the Examiner must teach or suggest all of the limitations of the claims. See *In re Zurko*, 111 F.3d 887, 888-89, 42 U.S.P.Q.2d 1467, 1478 (Fed. Cir. 1997); *In re Wilson*, 424 F.2d

1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."). The teachings or suggestions, as well as the expectation of success, must come from the prior art, not applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). In this instance, from the information detailed above, it is clear that Glatkowski fails to teach or suggest all the limitations of Applicant's claim 1, thus claim 1 is not unpatentable under 35 U.S.C. §103(a) and the rejection should be removed.

Claims 1-5, 8, 10-12, 14, 16 and 18-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application No. 2003/0122111 to Glatkowski (hereinafter referred to as "Glatkowski") in view of U.S. Patent Application No. 2005/0025694 to Zhang (hereinafter referred to as "Zhang"). Applicant respectfully traverses.

Applicant restates all arguments previously presented to reiterate that Glatkowski does not disclose the invention of claims 1-5, 8, 10-12, 14, 16 and 18-19. Specifically, Glatkowski discloses the suspension of SWNTs in sodium dodecyl sulfate (SDS) and PVP in solution. (See Paragraph 131). This is contrary to the instant invention which omits the inclusion of SDS in any claim. The prior art reference or combination of references

relied upon by the Examiner must teach or suggest all of the limitations of the claims. See *In re Zurko*, 111 F.3d 887, 888-89, 42 U.S.P.Q.2d 1467, 1478 (Fed. Cir. 1997); *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."). The teachings or suggestions, as well as the expectation of success, must come from the prior art, not applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

Regarding claim 1, Glatkowski discloses the suspension of SWNTs in sodium dodecyl sulfate (SDS) and PVP in solution. (See Paragraph 131). This is in stark contrast to claim 1 of the instant invention which omits the inclusion of SDS. The Examiner then specifically references claim 1 on Page 3, lines 1-15 and states that, "Glatkowski et al does not specifically teach using a nonionic surfactant as the instant claim." The Examiner then speaks about Zhang disclosing the use of a nonylphenoxypropyl-(ethenoxy) ethano-type surfactant (a nonionic surfactant). However, claim 1 does not include the use of a nonionic surfactant, so this line of reasoning is fundamentally flawed. The Examiner's reliance on Zhang in reference to claim 1 is obviously misplaced.

Regarding claim 12, Glatkowski further discloses a method of suspending SWNTs in a solution of sodium dodecy sulfate (SDS) and PVP followed by an incubation period of twelve hours at 50°C, flocculation with IPA, centrifugation, and multiple washings in water. (See Paragraph 131). Again, this is in stark contrast to claim 12 of the instant invention which discloses a method for producing a carbon nanotube dispersion liquid which does not include any of the above steps and also omits the inclusion of SDS. Claim 12 of the instant invention calls for the mixing and dispersing of a carbon nanotube in a mixture solution of an amide-based organic solvent and a PVP under ultrasonication (Specification, Page 5, Lines 14-19).

Regarding claim 2, Glatkowski discloses the suspension of SWNTs in sodium dodecy sulfate (SDS) and PVP in solution. Glatkowski also makes a passing reference to the inclusion of a surfactant. This is contrary to claim 2 of the instant invention which omits the inclusion of SDS and specifically calls for the use of a nonionic surfactant. By the Examiner's own admission on Page 4, Line 4 of the previous office action, Glatkowski fails to teach the use of a nonionic surfactant. In fact, the word "nonionic" never even appears within the Glatkowski specification. The Examiner then references Zhang and speaks about Zhang disclosing the use of a nonylphenoxyxypoly-(ethenoxy) ethano-type surfactant (a nonionic surfactant). The Examiner

attempts to combine Glatkowski and Zhang's compositions together to illustrate the obviousness of substituting "the anionic surfactant of Glatkowski with a nonionic surfactant (such as nonylphenoxyxypoly-(ethenoxy)) of Zhang, as it not only can contain more carbon nanotubes used for producing the electrically conductive film, it generates a uniformly and stable carbon nanotube dispersion in liquid." (page 5, lines 2-8). However, the Examiner's reliance on Zhang is misplaced as the logical flaws in relying on Glatkowski are already fatal. Additionally, both Glatkowski and Zhang fail to teach or suggest the possibility of substituting an anionic surfactant with a nonionic surfactant.

Regarding claim 14 Glatkowski further discloses a method of suspending SWNTs in a solution of sodium dodecy sulfate (SDS) and PVP followed by an incubation period of twelve hours at 50°C, flocculation with IPA, centrifugation, and multiple washings in water. This is contrary to claim 14 of the instant invention which omits the inclusion of SDS and specifically calls for the use of a nonionic surfactant. Claim 14 of the instant invention calls for the mixing and dispersing of a carbon nanotube in a mixture solution of an amide-based organic solvent and a nonionic surfactant under ultrasonication followed by mixing the resultant dispersion with a PVP. (Specification, Page 5, Lines 14-19). As with claim 2 above, the Examiner attempts to combine Glatkowski

and Zhang's compositions together. Again, as with claim 2 above, the Examiner's reliance on Zhang is misplaced as the logical flaws in relying on Glatkowski are already fatal. Additionally, both Glatkowski and Zhang fail to teach or suggest the possibility of substituting an anionic surfactant with a nonionic surfactant.

As stated above, the prior art reference or combination of references relied upon by the Examiner must teach or suggest all of the limitations of the claims. See *In re Zurko*, 111 F.3d 887, 888-89, 42 U.S.P.Q.2d 1467, 1478 (Fed. Cir. 1997); *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."). The teachings or suggestions, as well as the expectation of success, must come from the prior art, not applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). In this instance, from the information detailed above, it is clear that Glatkowski and Zhang, whether considered separately or in combination, fail to teach or suggest all the limitations of Applicant's claims 1, 2, 12 or 14, thus claims 1, 2, 12 and 14 are not unpatentable under 35 U.S.C. §103(a) and the rejections should be removed.

The U.S. Supreme Court recently held that rigid and mandatory application of the "teaching-suggestion-motivation," or TSM, test is incompatible with its precedents. *KSR Int'l Co. v. Teleflex, Inc.* 127 S.Ct 1727, 1741 (2007). The Court did not, however, discard the TSM test completely; it noted that its precedents show that an invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id.*

The Court held that the TSM test must be applied flexibly, and take into account a number of factors "in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed." *Id.* at 1740-41. Despite this flexibility, however, the Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the way the claimed new invention does." *Id.* "To facilitate review, this analysis should be made explicit." *Id.*

The obviousness rationale addressed in *KSR* was premised on combining elements known in the prior art. *Id.* at 1738-39. The *KSR* Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the

art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741.

In the same way, when the prior art teaches away from the claimed solution, obviousness cannot be proven merely by showing that a known composition could have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition. See also *Ex parte Thomas J. Whalen II, et al*, BPAI 2007-4423 (2008).

Based on *KSR v. Teleflex, Inc.* 127 S.Ct. 1727, 167 L.Ed2d 705, 2007 U.S. Lexis 4745 (2007), the obviousness question may be broken down to: Is the invention predictable based upon the prior art? *Id.* at 1740, 721. In the instant case, the answer to that question is simply "no." Hindsight reconstruction is not permitted as the Federal Circuit has repeatedly warned that the requisite motivation to modify a reference must come from the prior art, not Applicant's specification. See *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-32 (Fed. Cir. 1988) ("there must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure.") Using an Applicant's disclosure as a blueprint to reconstruct the claimed invention

from isolated piece of the prior art contravenes the statutory mandate of section 103 of judging obviousness at the point in time when the invention was made. See *Grain Processing Corp. v. American Maize-Products Co.*, 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988).

Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987); *In re Abele*, 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); see also *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). Hence, since independent claims 1, 2, 12 and 14 are nonobvious, dependent claims 3-5, 8, 10-11, 16 and 18-19 are also nonobvious and the rejection under §103(a) as being unpatentable over Glatkowski in view of Zhang should be removed.

Claims 1, 3-5, 6-10, 12-13 and 14-17 were rejected under 35 U.S.C. §103(a) as being unpatentable by U.S. Patent Application No. 2002/0046872 to Smalley (hereinafter referred to as "Smalley") in view of U.S. Patent Application No. 2005/0025694 to Zhang (hereinafter referred to as "Zhang"). Applicant respectfully traverses.

The above comments and arguments regarding both Glatkowski and Zhang are incorporated herein. Smalley, like Glatkowski above, discloses the suspension of SWNTs in sodium dodecyl sulfate (SDS) and PVP in solution. (See Paragraph 64). This is in contrast to the instant invention which omits the inclusion of SDS in any claim. As previously stated, the prior art reference or combination of references relied upon by the Examiner must teach or suggest all of the limitations of the claims. See *In re Zurko*, 111 F.3d 887, 888-89, 42 U.S.P.Q.2d 1467, 1478 (Fed. Cir. 1997); *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."). The teachings or suggestions, as well as the expectation of success, must come from the prior art, not applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). In this instance, from the information detailed above, it is clear that both Smalley and Zhang, whether considered together or separately, fail to teach or suggest all the limitations of Applicant's claims, thus claims 1, 3-5, 6-10, 12-13 and 14-17 are not unpatentable under 35 U.S.C. §103(a) and the rejection should be removed.

Conclusion

In view of the foregoing, Applicant respectfully requests an early Notice of Allowance in this application.

Respectfully submitted,



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